

### ABSTRACT OF THE DISCLOSURE

An apparatus for improving the density and uniformity of plasma in the manufacture of a semiconductor device features a plasma chamber having a complex geometry that causes plasma density to be increased at the periphery or edge of a semiconductor wafer being processed, thereby compensating for a plasma density that is typically more concentrated at the center of the semiconductor wafer. By mounting a target semiconductor wafer in a chamber region that has a cross-sectional area that is smaller than a cross-sectional area of a plasma source chamber region, a predetermine flow of generated plasma from the source becomes concentrated as it moves toward the semiconductor wafer, particularly at the periphery of the semiconductor wafer. This provides a more uniform plasma density across the entire surface of the target semiconductor wafer than has heretofore been available.